

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau

(43) International Publication Date  
3 June 2004 (03.06.2004)

PCT

(10) International Publication Number  
WO 2004/046031 A1(51) International Patent Classification<sup>7</sup>: C01B 31/02, D01F 11/12

(74) Agents: MAEBIUS, Stephen, B. et al.; Foley &amp; Lardner, Suite 500, 3000 K Street, N.W., Washington, DC 20007-5101 (US).

(21) International Application Number:

PCT/US2003/036844

(22) International Filing Date:

18 November 2003 (18.11.2003)

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/427,097 18 November 2002 (18.11.2002) US

(84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(71) Applicant (for all designated States except US): RENSSELAER POLYTECHNIC INSTITUTE [US/US]; 110 8th Street, Troy, NY 12180-3590 (US).

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2004/046031 A1

(54) Title: NANOTUBE POLYMER COMPOSITE AND METHODS OF MAKING SAME

(57) Abstract: The invention relates to derivatized, well-dispersed CNTs that have enhanced miscibility with organic agents. Composite materials may be made using such CNTs. The composite materials, in turn, may be used in optical and electronic applications.

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 03/36844

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 7 C01B31/02 D01F11/12

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C01B D01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category <sup>a</sup>	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2002/110513 A1 (SMALLEY RICHARD E ET AL) 15 August 2002 (2002-08-15) the whole document	1-48
X	WO 02/060812 A (UNIV RICE WILLIAM M ; YANG JIPING (US); BAHR JEFFREY L (US); TOUR JAME) 8 August 2002 (2002-08-08) page 18, line 27 - page 21, line 5 examples 19-25 claim 1	46, 47
A	----- -/-	1-45, 48

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

<sup>a</sup> Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the International search

Date of mailing of the International search report

19 March 2004

25/03/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Marquis, D

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US 03/36844

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EDERLE Y ET AL: "CARBANIONS ON GRAFTED C60 AS INITIATORS FOR ANIONIC POLYMERIZATION" MACROMOLECULES, AMERICAN CHEMICAL SOCIETY. EASTON, US, vol. 30, no. 15, 28 July 1997 (1997-07-28), pages 4262-4267, XP000657706 ISSN: 0024-9297 the whole document -----	1-48

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

 International application No  
 PCT/US 03/36844

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
US 2002110513	A1	15-08-2002	AU	6044599 A		10-04-2000
			CA	2344577 A1		30-03-2000
			EP	1112224 A1		04-07-2001
			JP	2002526360 T		20-08-2002
			US	2001041160 A1		15-11-2001
			CN	1383418 T		04-12-2002
			WO	0017101 A1		30-03-2000
			US	2001031900 A1		18-10-2001
			US	2002086124 A1		04-07-2002
			US	2002004028 A1		10-01-2002
WO 02060812	A	08-08-2002	GB	2389847 A		24-12-2003
			WO	02060812 A2		08-08-2002